

AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Previously Presented) A communication system which sets a periodic transmission timing in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time and the quasi-data transmission time of the same period of the transmission timing.

3. (Previously Presented) A communication system which sets a periodic transmission timing in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and transmits a first and a second data by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission

path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time of the particular period, and

data bits of the second data transmitted during the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time of the particular period where the first data have not been assigned.

4. (Previously Presented) A communication system which sets a periodic transmission timing in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and transmits a first and a second data by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time and the quasi-data transmission time of the particular period and distributed uniformly over each of the data transmission time and the quasi-data transmission time of the particular period, and

data bits of the second data transmitted during the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time and the quasi-data transmission time of the particular period where the first data have not been assigned.

5. (Canceled)

6. (Previously Presented) A communication system which sets a periodic transmission timing in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time and the quasi-data transmission time of the same period of the transmission timing, and

the transmitted data bits are received, and symbols assigned to a particular period of the transmission timing are reproduced based on the data bits received as part of the data transmission time and the quasi-data transmission time of the particular period.

7. (Previously Presented) A communication system which sets a periodic transmission timing in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and transmits a first and a second data by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time of the particular period, and

data bits of the second data transmitted during the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time of the particular period where the first data have not been assigned, and

the transmitted data bits are received and symbols of the first data assigned to the particular period are reproduced based on the data bits received as part of the data transmission time for the particular period, and wherein symbols of the second data assigned to the particular period are reproduced based on the data bits received as part of the data transmission time of the particular period.

8. (Previously Presented) A communication system which sets a periodic transmission timing in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and transmits a first and a second data by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time and the quasi-transmission time of the particular period,

data bits of the second data transmitted during the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time and the quasi-data transmission time of the particular period where the first data have not been assigned, and

the transmitted data bits are received, and symbols of the first data assigned to the particular period are reproduced based on the data bits received as part of the data transmission time and the quasi-data transmission time of the particular period, while symbols of the second data assigned to the particular period are reproduced based on the data bits received as part of the data transmission time and the quasi-data transmission time of the particular period.

9. (Canceled)

10. (Previously Presented) A communication method in which a periodic transmission timing is set in accordance with a network transmission path such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time is set in the same period, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time and the quasi-data transmission time of the same period of the transmission timing.

11. (Previously Presented) A communication method in which a periodic transmission timing is set in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and a first and a second data are transmitted by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission

path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time of the particular period, and

data bits of the second data transmitted during the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time of the particular period where the first data have not been assigned.

12. (Previously Presented) A communication method in which a periodic transmission timing is set in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and a first and a second data are transmitted by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time and the quasi-data transmission time of the particular period, and

data bits of the second data transmitted during the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time and the quasi-data transmission time of the particular period where the first data have not been assigned.

13. (Canceled)

14. (Previously Presented) A communication method in which a periodic transmission timing is set in accordance with a network transmission path such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time is set in the same period, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time and the quasi-data transmission time of the same period of the transmission timing, and

the transmitted data bits are received, and symbols assigned to the particular period of the transmission timing are reproduced based on the data bits received as part of the data transmission time and the quasi-data transmission time of the particular period.

15. (Previously Presented) A communication method in which a periodic transmission timing is set in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and a first and a second data are transmitted by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time of the particular period,

data bits of the second data transmitted during the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time of the predetermined period where the first data have not been assigned, and

the transmitted data bits are received and symbols of the first data assigned to the particular period are reproduced based on the data bits received as part of the data transmission time for the particular period, and wherein symbols of the second data assigned to the predetermined period are reproduced based on the data bits received as part of the data transmission time of the particular period.

16. (Previously Presented) A communication method in which a periodic transmission timing is set in accordance with a network transmission path, such that each period of the transmission timing includes a data transmission time which is the time suitable for data transmission in the period and a quasi-data transmission time which is the time other than the data transmission time in the same period and a first and a second data are transmitted by multiplexing, wherein

a set of data bits to be transmitted over a plurality of periods of the transmission timing are organized into units of symbols and assigned to bit spaces allocated for transmission in such a manner that all the data bits in each of the symbols are transmitted on the network transmission path during the data transmission time of the same period of the transmission timing,

data bits of the first data transmitted during a particular period of the transmission timing are organized into one or more symbols, which are transmitted on the network transmission path during the data transmission time and the quasi-transmission time of the particular period,

data bits of the second data of the particular period are organized into one or more symbols, which are transmitted on the network transmission path in the portion of the data transmission time and the quasi-data transmission time of the predetermined period where the first data have not been assigned, and

the transmitted data bits are received, and symbols of the first data assigned to the particular period are reproduced based on the data bits received as part of the data transmission time and the quasi-data transmission time, while symbols of the second data assigned to the

particular period are reproduced based on the data bits received as part of the data transmission time and the quasi-data transmission time of the particular period.

17. (Previously Presented) A transmission device in a communication system, which transmits a set of data bits according to a periodic transmission timing, wherein each period of the transmission timing includes a first and second transmission time, and the set of data bits are transmitted over a plurality of periods of the transmission timing, the device being configured to:

organize the data bits into units of data symbols;

allocate a constant number of data bit spaces for transmission during each period of the transmission timing, the data bits spaces being allocated to achieve a higher transmission rate during the first transmission time than the second transmission time; and

assign the data bits in the data symbols to the allocated data bits spaces, such that all of the data bits in each data symbol are transmitted from the transmission device during the same period of the transmission timing.

18. (Previously Presented) The device according to claim 17, wherein the device is configured to:

assign the data bits, such that all of the data bits are transmitted during the first transmission time.

19. (Previously Presented) The device according to claim 18, wherein the first transmission time corresponds to far-end crosstalk time generated in a transmission data path.

20. (Previously Presented) The device according to claim 18, wherein

the one or more data symbols includes at least one symbol of a first data and at least one symbol of a second data, and

the device is configured to assign the data bits such that the at least one symbol of the first data is transmitted during the first transmission time, and the at least one symbol of the second data is transmitted during a portion of the first transmission time not assigned to the at least one symbol of the first data.

21. (Previously Presented) The device according to claim 17, wherein the device is configured to:

assign the data bits, such that all of the data bits are transmitted during the first and second transmission times, one portion of the assigned bits being uniformly distributed over the first transmission time, and the other portion of the assigned bits being uniformly distributed over the second transmission time.

22. (Previously Presented) The device according to claim 21, wherein

the first transmission time corresponds to far-end crosstalk time generated in a data transmission path and the second transmission time corresponds to near-end crosstalk time generated in the data transmission path.

23. (Previously Presented) The device according to claim 21, wherein

the one or more data symbols includes at least one symbol of a first data and at least one symbol of a second data, and

the device is configured to assign the data bits such that the at least one symbol of the first data is transmitted during the first and second transmission times, and the at least one symbol of the second data is transmitted during a portion of the first and second transmission times not assigned to the at least one symbol of the first data.

24. (Previously Presented) A method of transmitting a set of data bits according to a periodic transmission timing, wherein the set of data bits are transmitted over a plurality of periods of the transmission timing, comprising:

setting a first and second transmission time for each period of the transmission timing;

organizing the data bits into units of data symbols;

allocating a constant number of data bit spaces for transmission during each period of the transmission timing, the data bit spaces being allocated to achieve a higher transmission rate during the first transmission time than the second transmission time; and

assigning the data bits in the data symbols to the allocated data bit spaces, such that all of the data bits in each data symbol are transmitted during the same period of the transmission timing.

25. (Previously Presented) The method according to claim 24, further comprising:

assigning the data bits, such that all of the data bits are transmitted during the first transmission time.

26. (Previously Presented) The method according to claim 25, wherein the first transmission time corresponds to far-end crosstalk time generated in a transmission data path.

27. (Previously Presented) The method according to claim 25, wherein

the one or more data symbols includes at least one symbol of a first data and at least one symbol of a second data, and

the data bits are assigned, such that the at least one symbol of the first data is transmitted during the first transmission time, and the at least one symbol of the second data is transmitted during a portion of the first transmission time not assigned to the at least one symbol of the first data.

28. (Previously Presented) The method according to claim 24, wherein the device is configured to:

assign the data bits, such that all of the data bits are transmitted during the first and second transmission times, one portion of the assigned bits being uniformly distributed over the first transmission time, and the other portion of the assigned bits being uniformly distributed over the second transmission time.

29. (Previously Presented) The method according to claim 28, wherein

the first transmission time corresponds to far-end crosstalk time generated in a data transmission path and the second transmission time corresponds to near-end crosstalk time generated in the data transmission path.

30. (Previously Presented) The method according to claim 28, wherein

the one or more data symbols includes at least one symbol of a first data and at least one symbol of a second data, and

the data bits are assigned, such that the at least one symbol of the first data is transmitted during the first and second transmission times, and the at least one symbol of the second data is transmitted during a portion of the first and second transmission times not assigned to the at least one symbol of the first data.

31. (Canceled)

32. (New) A data transmitting apparatus, comprising:

a rate converter configured to perform rate conversion on an input data stream including a plurality of input symbols, and configured to generate an output data stream including a plurality of sets of output symbols, each set being defined based on cyclic ISDN noise, the bits in each output symbol being distributed based on a bitmap, and each output symbol having a time length different from a time length of the corresponding input symbol;

a FEXT symbol recognizing unit configured to recognize a plurality of specific output

symbols in each of the sets of output symbols as FEXT symbols that are suitable for data transmission in terms of the cyclic ISDN noise; and

a bit assigning unit configured to assign bits to output symbols in such a manner that when the set of output symbols has four FEXT symbols, a number of bits in a bitmap for each of the four FEXT symbols in the set is obtained based on a quotient calculated by dividing by four a total number of bits in a certain number of input symbols having a total time length corresponding to a time length of one cycle of the ISDN noise.

33. (New) A data transmitting method, comprising:

a rate converting step of performing rate conversion on an input data stream including a plurality of input symbols, and thereby generating an output data stream including a plurality of sets of output symbols, each set being defined based on cyclic ISDN noise, the bits in each output symbol being distributed based on a bitmap, and each output symbol having a time length different from a time length of the corresponding input symbol;

a FEXT recognizing step of recognizing a plurality of specific output symbols in each of the set of output symbols as FEXT symbols that are suitable for data transmission in terms of the cyclic ISDN noise, and

a bit assigning step of assigning bits to output symbols in such a manner that when the set of output symbols has four FEXT symbols, a number of bits in a bitmap for each of the four FEXT symbols in the set is obtained based on a quotient calculated by dividing by four a total number of bits in a certain number of input symbols having a total time length corresponding to the time length of one cycle of the ISDN noise.